

1. (amended) A projection lens for forming an image of an object, said projection lens having a focal length f_0 and consisting in order from its image side of:

(A) a first lens unit having a focal length f_1 and comprising [: (i)] a lens element having a focal length f_{E1} , [; and] said lens element comprising [(ii)] at least one aspherical surface for correction of distortion; and

(B) a second lens unit having a focal length f_2 and consisting in order from its image side of:

(i) a first lens subunit having a focal length f_{2S1} ; and

(ii) a second lens subunit separated from the first lens subunit by an airspace and having a focal length f_{2S2} , said second lens subunit comprising: (a) at least one aspherical surface for correction of spherical aberration, and (b) means for providing axial color correction for the lens system;

wherein:

$$|f_1|/f_0 > 0.75;$$

$$f_{E1} < 0;$$

$$f_2 > 0;$$

$$f_2/f_0 < 2.0$$

$$f_{2S1} > 0;$$

$$f_{2S1}/f_0 < 1.5; \text{ and}$$

$$|f_{2S2}|/f_0 > 1.5.$$

17. A projection lens system comprising:

(A) a screen;

(B) a pixelized panel; and

(C) a projection lens for forming a magnified image of the pixelized panel on the screen, said projection lens consisting of:

(i) a first lens unit; and

(ii) a second lens unit which has a positive power and consists of first and second lens subunits which are separated from one another by an airspace;

wherein:

(a) the first lens unit comprises a negative lens element which comprises at least one aspherical surface for correction of distortion;

(b) the maximum clear aperture of the first lens unit is less than 0.7 times the diagonal of the pixelized panel;

(c) the second lens unit provides most of the power of the projection lens;

(d) the second lens subunit of the second lens unit comprises at least one aspherical surface for correction of spherical aberration;

(e) the projection lens has a half field of view in the direction of the screen of at least 35°; and

(f) the total number of lens elements of the projection lens is five or six.

18. The projection lens system of Claim 17 further comprising a Fresnel lens between the pixelized panel and the projection lens.

19. The projection lens system of Claim 17 wherein the projection lens has a focal length f_0 , the first lens unit has a focal length f_1 , the second lens unit has a focal length f_2 , the first lens subunit of the second lens unit has a focal length f_{2S1} , the second lens subunit of the second lens unit has a focal length f_{2S2} , and

$$|f_1|/f_0 > 0.75;$$

$$f_2/f_0 < 2.0;$$

$$f_{2S1} > 0;$$

$$f_{2S1}/f_0 < 1.5; \text{ and}$$

$$|f_{2S2}|/f_0 > 1.5.$$

20. The projection lens system of Claim 17 wherein the second lens subunit of the second lens unit consists in order from its image side of: (a) a negative lens element, (b) a positive lens element, and (c) a plastic lens element having at least one aspherical surface.

21. The projection lens system of Claim 20 wherein the plastic lens element of the second lens subunit has a positive on-axis power.

22. The projection lens system of Claim 20 wherein the plastic lens element of the second lens subunit has a negative on-axis power.

23. The projection lens system of Claim 20 wherein the negative lens element of the second lens subunit has a higher dispersion than the positive lens element of the second lens subunit.

24. The projection lens system of Claim 17 wherein the projection lens has a focal length f_0 , the negative lens element of the first lens unit has a focal length f_{E1} , and

$$|f_{E1}|/f_0 < 1.5.$$

25. The projection lens system of Claim 17 wherein the projection lens has a focal length f_0 , the length of the airspace between first and second lens subunits of the second lens unit is t_{S1S2} , and

$$t_{S1S2}/f_0 > 0.1.$$

26. The projection lens system of Claim 17 wherein the maximum clear aperture of the first lens unit is greater than the maximum clear aperture of the second lens unit.

27. The projection lens system of Claim 17 wherein the second lens unit has a rear principal point which is located ahead of the image end of the second lens subunit.

28. The projection lens system of Claim 17 wherein the projection lens has a distortion which is less than one percent at the image.

29. The projection lens system of Claim 17 wherein the projection lens has a lateral color aberration at the pixelized panel which is less than a pixel.

30. The projection lens system of Claim 17 wherein the system comprises an illumination system which comprises a light source and illumination optics which forms an image of the light source, said image of the light source being the output of the illumination system.

31. The projection lens system of Claim 17 wherein the magnification of the system is changed by changing: (i) the distance between the projection lens and the pixelized panel; and (ii) the distance between the first and second lens units.

32. The projection lens system of Claim 15 further comprising a Fresnel lens between the pixelized panel and the projection lens.